1. An apparatus for suppressing intersymbol interference in a received communication channel of a modem comprising:

- means for adjusting the sampling rate of the received communication channel; and
- a time domain equalizer (TEQ) with a plurality of taps into the received communication channel and the TEQ responsive to an adjustment of the sampling rate by the means for adjusting to configure at least one of a number of taps and delays between the taps operating on the receive path.

A1

2. The apparatus of Claim 1, further comprising:

- means for adjusting a demodulation rate of the received communication channel to correspond with the sampling rate adjustment of the means for adjusting.

3. The apparatus of Claim 1, wherein the means for adjusting the sampling rate comprises at least one of:

- an analog-to-digital converter with a variable sampling rate; and
- a decimator with a variable decimation amount.

A2

4. The apparatus of Claim 1, wherein the TEQ further comprises:

- a delay line accepting successive portions of a received communication channel;
- taps off of the successive portions of the delay line with each tap configured to scale each successive portion by an associated weighting coefficient to provide a corresponding scaled output;
- a summer coupled to the taps to sum the scaled outputs there from; and

CONT

- a controller to varying at least one of: a length of the delay line, a number of the taps providing output to the summer and a number of successive portions of the received communication channel between taps.

A2 5. The apparatus of Claim 4, wherein the TEQ delay line further comprises:

- delay buffers; and
- switches serially coupling the delay buffers one to another to form the delay line accepting successive portions of the received communication channel, and the switches operative to uncouple at least one of the delay buffers to shorten a length of the delay line.

CONT 6. The apparatus of Claim 4, wherein the TEQ taps further comprise:

- weighting modules each with an input coupled to a corresponding successive portion of the delay line and an output coupled to the summer, and each of the weighting modules configured to scale each corresponding successive portion by the associated weighting coefficient to provide the corresponding scaled output; and
- switches each associated with a corresponding weighting module to switchably control the coupling thereof between the delay line and the summer, and the switches operative to uncouple selected ones of the weighting modules to vary a number of the taps providing output to the summer.

7. The apparatus of Claim 4, wherein the TEQ controller further comprises:

- a skip controller to determine from relative magnitudes of the weighting coefficients for each of the taps generated in a training phase of operation the number of the taps providing output to the summer.

8. A method for suppressing intersymbol interference in a received communication channel of a modem comprising:

A2

- determining a highest useful frequency component in the received communication channel;
- adjusting the sampling rate of the received communication channel to conform with the determination of the highest useful frequency component; and
- adjusting at least one of a number of time domain equalization taps operating on the receive path and delays between the taps operating on the receive path responsive to the adjustment of the sampling rate in the act of adjusting the sampling rate.

CONT

9. The apparatus of Claim 1, further comprising:

- adjusting a demodulation rate of the received communication channel to correspond with the sampling rate adjustment of the means for adjusting.

10. A modem with a transmit and a receive path both configured to couple to at least one subscriber line and the modem comprising:

- a time domain equalizer (TEQ) having taps on the receive path of the modem to reduce intersymbol interference therein, and the TEQ configurable to vary at least one of a number of taps and delays between the taps operating on the receive path.

11. The modem of Claim 10, further comprising:

- means for determining a highest usable frequency component of the received

communication channel; and

- the TEQ responsive to a determination of the highest usable frequency to vary at least a number of the taps operating on the receive path, wherein a reduction in the highest usable frequency corresponds with an increase in the number of taps operating on the receive path.

A2

12. The modem of Claim 10, wherein the TEQ further comprises:

- a delay line accepting successive portions of a received communication channel;
- taps off of the successive portions of the delay line with each tap configured to scale each successive portion by an associated weighting coefficient to provide a corresponding scaled output;
- a summer coupled to the taps to sum the scaled outputs there from; and
- a controller to varying at least one of: a length of the delay line, a number of the taps providing output to the summer and a number of successive portions of the received communication channel between taps.

CONT

13. The modem of Claim 12, wherein the TEQ delay line further comprises:

- delay buffers; and
- switches serially coupling the delay buffers one to another to form the delay line accepting successive portions of the received communication channel, and the switches operative to uncouple at least one of the delay buffers to shorten a length of the delay line.

14. The modem of Claim 12, wherein the TEQ taps further comprises:

- weighting modules each with an input coupled to a corresponding successive portion of the delay line and an output coupled to the summer, and each of the weighting modules configured to scale each corresponding successive portion by the associated weighting coefficient to provide the corresponding scaled output; and

- switches each associated with a corresponding weighting module to switchably control the coupling thereof between the delay line and the summer, and the switches operative to uncouple selected ones of the weighting modules to vary a number of the taps providing output to the summer.

A2

15. The modem of Claim 12, wherein the TEQ controller further comprises:

- a skip controller to determine from relative magnitudes of the weighting coefficients for each of the taps generated in a training phase of operation the number of the taps providing output to the summer.

CONT

16. The modem of Claim 12, wherein the TEQ controller further comprises:

- a length controller to vary the length of the delay line inversely with respect to a length of the at least one subscriber line.

17. The modem of Claim 10, wherein the modem supports a multi-tone modulation and demodulation protocol.

18. A method for time domain equalization of a received communication channel comprising:

- buffering successive portions of a received communication channel;

- scaling each successive portion of the received communication channel buffered in the buffering act by an associated weighting coefficient to provide a corresponding scaled output;
- summing the scaled outputs from the scaling act; and
- varying at least one of:
    - a number of successive portions of the received communication channel buffered in the buffering act; and
    - a selection of the successive portions of the received communication channel scaled in the scaling act;

  to equalize intersymbol interference.

A2

19. The method of Claim 18, wherein the scaling and varying acts further comprise:

CONT

- generating weighting coefficients for each successive portion of the received communication channel during a training phase of the communication channel; and
- determining relative magnitudes of the weighting coefficients generated in the generating act;
- selecting a subset of the successive portions of the received communication channel for scaling with corresponding weighting coefficients during an operational phase of the communication channel based at least on the relative magnitudes of the weighting coefficients determined in the determining act.

20. The method of Claim 18, wherein the varying act further comprises:

- determining a highest usable frequency component of the received communication channel; and

A2 CONT

- varying a number of successive portions of the received communication channel buffered in the buffering act inversely with respect to the highest usable frequency of the received communication channel determined in the determining act.